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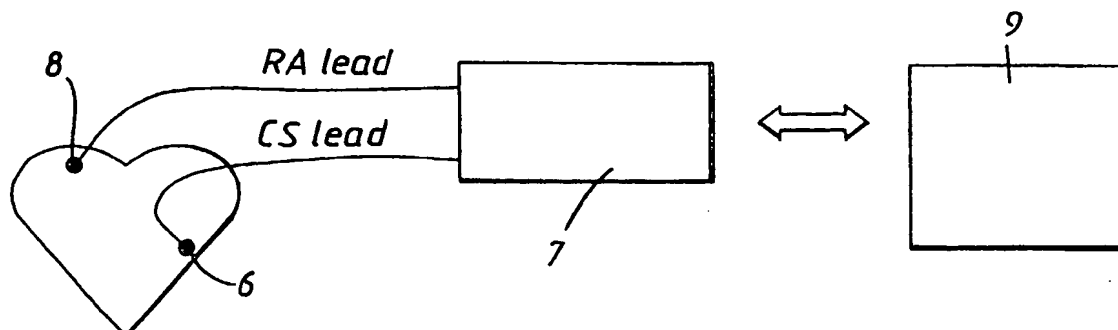
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A CONGESTIVE HEART FAILURE MONITOR



(57) Abstract: A congestive heart failure monitor comprises an impedance measuring unit to measure the impedance between at least two electrodes intended to be implanted in a patient such that a change in the left atrium volume results in a change of the measured impedance. Analysing means are provided for analysing the measured impedance for detecting an incipient congestive heart failure.

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 03/01081

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61B 5/053, A61N 1/368

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A61B, A61N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ, INSPEC, MEDLINE, BIOSIS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6223079 B1 (BAKELS, A. ET AL), 24 April 2001 (24.04.01), column 4, line 1 - line 10; column 6, line 55 - line 66; column 10, line 11 - line 25	1-14,17-18
A	--	15-16
A	EP 0985429 A2 (VITATRON MEDICAL B.V.), 15 March 2000 (15.03.00), see paragraph 27 - 31	2-10
A	--	
A	US 6278894 B1 (SALO, R.W. ET AL), 21 August 2001 (21.08.01), abstract	1-18
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Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

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International application No.

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**C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4674518 A (SALO. R.W.), 23 June 1987 (23.06.87), abstract  -----	1-18

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

26/07/03

International application No.  
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Patent document cited in search report			Publication date	Patent family member(s)		Publication date
US	6223079	B1	24/04/01	AU	1714499 A	05/07/99
				EP	1039951 A	04/10/00
				US	6070100 A	30/05/00
				US	6219579 B	17/04/01
				US	6223082 B	24/04/01
				US	6238420 B	29/05/01
				US	2001010009 A	26/07/01
				WO	9930777 A	24/06/99
EP	0985429	A2	15/03/00	US	6104949 A	15/08/00
US	6278894	B1	21/08/01	AU	4825100 A	09/01/01
				WO	0078391 A	28/12/00
US	4674518	A	23/06/87	CA	1261066 A	26/09/89
				DE	3629587 A,C	12/03/87
				FR	2586925 A,B	13/03/87
				GB	2180072 A,B	18/03/87
				GB	8620618 D	00/00/00
				JP	1688353 C	11/08/92
				JP	3054576 B	20/08/91
				JP	62084740 A	18/04/87